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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

ANGEBRANNDT, MARTIN J

ART UNIT	PAPER NUMBER
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1756

12

DATE MAILED: 01/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/620,469

Applicant(s)

YOON ET AL.

Examiner

Martin J Angebranndt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-3,5,6,8-11 and 13-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) -3,5,6,8-11 and 13-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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1. The response provided by the applicant has been read and given careful consideration.

Responses to the arguments and amendments of the applicant are presented after the first rejection to which they are directed. Rejections and objections of the previous office action not repeated below are withdrawn based upon the arguments and amendments of the applicants.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 14-21 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Ohno et al. '783.

Example 1 has a substrate, coated a zinc sulfide-silicon dioxide dielectric layer followed by alternating layers of GeTeSb phase change recording layer and dielectric materials until a final dielectric layer is formed and a reflective layer formed on that. (no protective layer on reflective layer

In response to the arguments of the applicant, the examiner notes that the GeSbTe recording materials are known to undergo phase change between amorphous and crystalline

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phases as evidenced by the language describing the phase change recording materials as having an amorphous state and a crystalline state in column 2 at lines 16-20. The examiner's position is that with respect to the references utilizing plural phase change recording layers, the phase change recording layer closest to the substrate acts as a phase control layer as the light used to record the other layer(s) must pass through it. Additionally, the applicant seeks coverage for this embodiment as evidenced by claims 5,8 and 13. As above the examiner holds that this is inherent

The applicant's arguments fail to address the fact that the phase change recording layers of the reference are GeTeSb recording layers which according to the instant specification (page 8 at lines 1-5) and the prior art undergo phase changes and therefore inherently meet the functional limitation of the phase control layer and as these would be used in recording would clearly have areas of differing phase shift (optical thickness) due to the different refractive index over the same physical thickness. There may be an issue about how they are used, but the claims are directed to the article irrespective of use. The change in refractive index inherently reduces the spot size achievable as the refractive index increase reduces the diffraction limit of the spot size (particularly important for near field applications). As the light is absorbed by the recording layers as it progresses through the thickness, the beam intensity is reduced, so it would be possible to reduce the beam power to record in only the nearest layer, but not the others. The reproduction beam passing through the nearest phase change layer must be affected by the change in the refractive indices throughout that layer when reading the other layers as it passes through this layer. The applicant is arguing an intended use broader than the article claims under prosecution.

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5. Claim 1, 2, 9-11 and 14-21 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Kasami et al. 221.

The examples of figure 3 describes a polycarbonate substrate, a zinc sulfide-silicon dioxide dielectric layer, a SbSe phase change materials, a zinc sulfide-silicon dioxide dielectric layer, a UV cured spacer layer, a zinc sulfide-silicon dioxide dielectric layer, a SbTeGe recording layer, a zinc sulfide-silicon dioxide dielectric layer, a spacer layer, a zinc sulfide-silicon dioxide dielectric layer, a GeSbTe recording layer, a zinc sulfide-silicon dioxide dielectric layer, a reflective layer and a UV cured protective layer. (3/47-4/29).

In addition to the basis provided above, the examiner cites column 1/lines 17-54, 2/61-64 and 4/30-40 to support his position that the recording media of the prior art undergo transitions between the amorphous and crystalline states.

6. Claim 1, 2, 9-11 and 14-21 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Rosen et al. 188.

The examples of figure 3 describes a polycarbonate substrate, a zinc sulfide-silicon dioxide dielectric layer, a SbTeGe recording layer, a Si thermal dissipation layer, a silicon nitride dielectric layer, a spacer layer, a zinc sulfide or silicon dioxide dielectric layer, a GeSbTe recording layer, a zinc sulfide or silicon dioxide dielectric layer, a reflective layer and a protective layer. (9/15-10/15). The use of other recording layer materials is disclosed. (11/44-59).

In addition to the basis provided above, the examiner cites 1/31-49 to support his position that the recording media of the prior art undergo transitions between the amorphous and crystalline states. The issue of the adjustable focus lens is somewhat moot due to the claims being directed to the article, not the mode/methods of use. The rejection stands.

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7. Claims 1,2,9-11 and 14-21 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Miyauchi et al. JP 09-007224.

See figure 1 and description on page 10.

The rejection stands for the reasons above. (note GeTeSb recording layer)

8. Claims 1,2,9-11 and 14-21 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Akahira et al. JP 03-157830.

The examples of figure 5 describes a polycarbonate substrate, a zinc sulfide dielectric layer, a SbTeGe recording layer, a zinc sulfide dielectric layer, a GeSbTe recording layer, a zinc sulfide dielectric layer, a reflective layer and a UV cured protective layer. (page 6/lower left column/example 1).

The rejection stands for the reasons above. (note GeTeSb recording layer)

9. Claims 1-3,6,9-11 and 14-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Akahira et al. JP 03-157830, Rosen et al. 188, Kasami et al. 221 or Miyauchi et al. JP 09-007224, in view of Tsukagoki et al. '014.

Tsukagoki et al. '014 discloses adding a dielectric layer between the reflective layer and the UV cured layer in phase change optical recording media. (18/35-47)

It would have been obvious to one skilled in the art to added a dielectric layer between the reflective layer and the protective layer of either Akahira et al. JP 03-157830, Rosen et al. 188, Kasami et al. 221 or Miyauchi et al. JP 09-007224 as this is known in the art as evidenced by Tsukagoki et al. '014 with the advantage of increasing the resistance of the resultant medium to mechanical damage.

The rejection stands for the reasons above.

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10. Claims 1,2,8-11, and 14-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coombs et al. '003, in view of Yamada et al. '260.

Example 2 describes a grooved substrate coated with a tantalum oxide layer, a gold layer, a tantalum oxide layer, a GeTeSe phase change recording layer, a tantalum oxide layer a reflective layer and a UV cured protective layer. (8/10-34). The use of other dielectric materials, such as silicon dioxide, titanium dioxide, zinc sulfide, aluminum nitride, tantalum oxide and mixtures therefore, is disclosed. (5/29-35) Useful materials for the reflective layer including Au, Al, Cu, or Ag are disclosed. (5/14-20).

Yamada et al. '260 teaches phase change recording media including InSbTe and GeSbTe (9/14-42) . Useful reflective layer materials include Ni, Al, Au and Cu. (10/6-10). Useful dielectric layers are also disclosed. (9/54-61).

The examiner holds that it would have been obvious to one skilled in the art to modify example 2 cited by using other reflective layer materials known in the art such as the Ni disclosed by Yamada et al. '260 in place of the lower gold reflective layer with a reasonable expectation of achieving comparable results based upon disclosed equivalent function.

The Coombs et al. '003 does not disclose the use of Ni as the lower reflective layer, teaching only Au, Al, Cu or Ag. This defect is cured by the addition of Yamada et al. '260 which discloses the equivalence of Au and Ni as reflective layer material. The examiner notes that the phase change property of Ni in response to light is not appreciated in the art of record and that the incorporation of limitations such as those found in claims 3,9 and 14 specifying the presence of the at least two areas of differing phase with the Ni phase control layer may provide a basis for patentability. Currently, the claims are broader than this and the disclosure of equivalence of

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Au and Ni in the instant specification parallels the teachings of equivalence within Yamada et al. '260.

11. Claims 1-3,6,8-11, and 14-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coombs et al. '003, in view of Yamada et al. '260 and Tsukagoki et al. '014.

It would have been obvious to one skilled in the art to added a dielectric layer between the reflective layer and the protective layer of Coombs et al. '003, as modified by Yamada et al. '260 as this is known in the art as evidenced by Tsukagoki et al. '014 with the advantage of increasing the resistance of the resultant medium to mechanical damage.

12. Claims 1-3,5,6,9-11 and 13-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Akahira et al. JP 03-157830, Rosen et al. 188, Kasami et al. 221 or Miyauchi et al. JP 09-007224,in view of Tsukagoki et al. '014 and further in view of Yamada et al. '260.

Tsukagoki et al. '014 discloses adding a dielectric layer between the reflective layer and the UV cured layer in phase change optical recording media. (18/35-47)

In addition to the basis provided above, it would have been obvious to one skilled in the art to replace one of the recording layers, such as the lower one of either Akahira et al. JP 03-157830, Rosen et al. 188, Kasami et al. 221 or Miyauchi et al. JP 09-007224 as modified by Tsukagoki et al. '014 with one of the recording layer materials disclosed by Yamada et al. '260 with a reasonable chance of forming a useful multilayered recording medium based upon the disclosure of equivalence of various recording layer materials by Yamada et al. '260.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebranntdt whose telephone number is 703-308-4397. The examiner can normally be reached on Mondays-Thursday and alternative Fridays.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464.

The fax phone numbers for the organization where this application or proceeding is assigned are 703-872 9310 for regular communications and 703-872 9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Martin J Angebranndt  
Primary Examiner  
Art Unit 1756

January 7, 2003